2.   (Amended) The groove of Claim 1, wherein the first plurality of sinusoidal marks has the same amplitude as the wobble.

3.   (Amended) The groove of Claim 1, wherein the first plurality of sinusoidal marks has a frequency greater than the frequency of the wobble.

4.   (Amended) The groove of Claim 3, wherein the first plurality of sinusoidal marks has a frequency 3 to 5 times the frequency of the wobble.

5.   (Amended) The groove of Claim 1, further comprising a second plurality of sinusoidal marks located at zero crossings of the wobble having a different phase than the first mark.

6.   (Amended) The groove of Claim 1, further comprising a second plurality of sinusoidal marks located at zero crossings of the wobble having the same phase as the first sinusoidal mark.

7.   (Amended) The groove of Claim 6, wherein first plurality of sinusoidal marks and the second plurality of sinusoidal marks are adjacent to each other such that they are aligned in a radial direction.

8.   (Amended) The groove of Claim 1, wherein the zero crossings are negative zero crossings.

9.   (Amended) The groove of Claim 1, wherein the zero crossings are positive zero crossings.

10.   The groove of Claim 1, further comprising more than one sinusoidal mark in a single cycle of the wobble.

11.   (Amended) A method for storing data on an optical disk, comprising:

creating a spiral groove with a sinusoidal deviation from a centerline of the spiral groove on the optical disk, the sinusoidal deviation having a first frequency; and

creating sinusoidal marks at zero crossings of the spiral groove, the sinusoidal marks having a second frequency;

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wherein the presence of one of the sinusoidal marks at one of the zero crossings represents an active bit and the absence of one of the sinusoidal marks at one of the zero crossings represents an inactive bit, a plurality of the active bits and the inactive bits representing an information field.

12.   The method of Claim 11, wherein the first frequency is less than the second frequency.

13.   The method of Claim 11, wherein said creating sinusoidal marks comprises inserting a sinusoidal mark in a zero crossing to indicate an active bit.

14.   The method of Claim 13, wherein the zero crossings are positive zero crossings.

15.   The method of Claim 13, wherein the zero crossings are negative zero crossings.

16.   The method of Claim 11, wherein said creating sinusoidal marks comprises generating sinusoidal marks in phase.

17.   The method of Claim 11, wherein said creating sinusoidal marks comprises generating more than one sinusoidal mark in one wobble cycle.

18.   (Amended) The method of Claim 11, where in said creating sinusoidal marks comprises:

        receiving data bits of said information field;

        encoding data bits to code bits according to an encoding scheme; and

        generating the sinusoidal marks at the zero crossings to represent the code bits.

19.   The method of claim 11, wherein the sinusoidal mark has the same amplitude as the sinusoidal deviation.

20.   (Amended) A method for reading information on an optical disk, comprising:

        detecting zero crossings of a wobble on the optical disk;

detecting sinusoidal marks in the wobble;

outputting an inactive bit upon detecting one of the zero crossings and not one of the sinusoidal marks; and

outputting an active bit upon detecting one of the sinusoidal marks;

wherein a plurality of the inactive bits and the active bits represents an information field.

21.   (Amended) The method of Claim 20, further comprising detecting a synchronization mark of a sector on the optical disk from the information field, wherein a predetermined sequence of inactive bits and active bits identifies the synchronization mark in the information field.

22.   The method of Claim 20, wherein the zero crossings are positive zero crossings.

23.   The method of Claim 20, wherein the zero crossings are negative zero crossings.

24.   (Amended) The method of Claim 20, further comprising detecting physical sector information for a sector from the information field.

25.   The method of Claim 24, wherein the physical sector information includes a physical sector address.

26.   (Amended) The method of Claim 20, further comprising detecting an error detection code from the information field.

27.   An optical drive comprising:

a matched filter;

a wobble detector; and

a bit detector coupled to a first output line of the matched filter and a second output line of the wobble detector.

28. The optical drive of Claim 27, wherein the bit detector comprises:

a first flip-flop comprising:

a first clock input terminal coupled to the first output line;

a third output line; and

a reset terminal;

a second flip-flop comprising:

a first data input terminal coupled to the third output line;

a second clock input terminal coupled to the second output line;

a delay buffer coupled to the second output line and the reset terminal.

29. The optical drive of Claim 28, wherein the first flip-flop further comprises a second data input terminal coupled to an active signal.

30. The optical drive of Claim 27, further comprising a memory coupled a fourth output line of the bit detector.

31. The optical drive of Claim 27, further comprising a synchronization mark detector.

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32. (Amended) A method for reading information on an optical disk, comprising:

determining a wobble frequency of a wobble;

detecting sinusoidal marks in the wobble according to the wobble frequency;

outputting an active bit upon detecting one of the sinusoidal marks; and

outputting an inactive bit when one of the sinusoidal marks is not detected;

wherein a plurality of the active bits and the inactive bits represents an information field.

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33.   (Amended) The method of Claim 32, wherein said information field includes a synchronization mark.

(Amended) 34.   The method of Claim 32, wherein said information field includes physical sector information for a sector.

(Amended) 35.   The method of Claim 32, wherein said information field includes an error correction code.

36. (New) The groove of Claim 1, wherein the information filed includes at least one of a synchronization mark, a sector information, and an error correction code.

37. (New) The method of Claim 11, wherein the information filed includes at least one of a synchronization mark, a sector information, and an error correction code.